

example in one or more later filed related applications.

Applicant has amended the specification and claims to substitute the term -thermoplastic- for the term "thermal plastic". Applicant submits that this merely constitutes correction of a typographical error as the term "thermoplastic" was originally intended.

Claims 3, 4, 10, 12, 13 and 30 have been amended to correct typographical errors. Claims 14 and 15 have been amended to remove what Applicant considers to be unnecessary limitations.

Independent claims 1, 18 and 26 have been amended in order to more clearly define the present invention over the references cited by the Examiner. More particularly, each of independent claims 1, 18 and 26 now includes the feature that the composite, composite component or fence rail/post, respectively, has a non-circular cross-section perpendicular to the length thereof, and further, is produced by a single coextrusion process. Applicant submits that the claims as amended are patentable over the references.

Original claim 17 has been canceled, without prejudice.

The Examiner has rejected claims 1-10 and 15-17 under 35 U.S.C. 102(b) as being anticipated by Sandt. Applicant traverses this rejection as is it pertains to claims 1-10, 15 and 16.

The present invention as now claimed, for example in amended claim 1, is defined as a composite having a length, the composite comprising an outer layer comprising a first polymeric material, a core layer circumscribed by the outer layer and comprising a second polymeric material, and an inner layer circumscribed by the core layer and comprising a third polymeric material, wherein the inner layer defines a hollow space. In addition, the composite is defined as having a non-circular cross-section perpendicular to the length and being produced by a single co-extrusion process.

Sandt does not disclose or even suggest a layered composite produced by coextrusion. In contrast to the present invention, the Sandt patent discloses a hollow tapered pole made of concentric

sleeves with a resin deposited (for example poured) therebetween. Sandt does not disclose, teach or suggest a composite produced by a single coextrusion process. In contrast to the present invention, Sandt describes the process of manufacturing its pole as including positioning an inner rigid sleeve within an outer rigid sleeve and introducing a resin into a hollow space between the sleeves.

The Examiner states "[w]ith regard to claim 17, Sandt discloses the pole being produced by a coextrusion process (column 3, lines 66 et seq.)"

Applicant respectfully disagrees. Sandt states in column 3, lines 66 et seq., "The larger and smaller sleeves are formed by ordinary extrusion methods" and continues with "The larger sleeve 18 is positioned in a generally horizontal position...[t]he smaller sleeve is aligned so as to enter inside the larger sleeve and be pulled to align both ends and thereby produce a hollow tapered pole." (See Sandt column 4, line 4 et seq.)

Sandt does not disclose any coextrusion process. Each sleeve is produced independently, for example by ordinary extrusion techniques, and then the sleeves are assembled together to form a hollow, tapered pole. This clearly teaches away from the present invention, for example as defined in the claims as amended.

Applicant submits that the present invention as recited in the amended claims is not anticipated by and is unobvious from and patentable over Sandt under 35 U.S.C. 102 and 35 U.S.C. 103.

The Examiner has rejected claims 1-5 and 7-8 under 35 U.S.C. 102(b) as being anticipated by Hart et al. Applicant traverses this rejection.

Applicant submits that Hart et al does not disclose, teach or suggest the present invention. For example, Hart et al does not even suggest a coextruded composite having a non-circular cross section perpendicular to its length. Hart discloses an apparatus and method for producing a multi-layered circular pipe formed of

two or more plastic resins. Hart et al does not even suggest any form other than a pipe form (i.e., a form having a circular axial cross-section).

In view of the above, applicant submits that claims 1-5, 7 and 8 are not anticipated by and are unobvious from and patentable over Hart et al under 35 U.S.C. 102 and 35 U.S.C. 103.

The examiner has rejected claims 11-14 and 18-25 under 35 U.S.C. 103(a) as being unpatentable over Sandt as applied to claim 1 in view of Finley. Applicant traverses this rejection.

Finley discloses a single layer, foamed wood fiber composite. Applicant submits that there is no motivation to combine the telescoping pole of Sandt with the foamed wood fiber composite of Finley. Again, Sandt involves a hollow pole structure made of concentric rigid sleeves having a resin deposited therebetween. Finley teaches wood-filled, single layer, shaped structural components, particularly fenestration units for residential and commercial structures.

The differences and distinctions between Sandt and Finley are so substantial that one of ordinary skill in the art would find no motivation to combine the teachings of these references for any purpose. Even if the wood fiber material of Finley were used as a reinforcing filler in Sandt's resin, as suggested by the Examiner, applicant submits that the combination would clearly not yield a three-layered, coextruded composite having a non-circular cross-section perpendicular to the length of the composite, as described and now claimed in the present application.

In view of the above, applicant submits that claims 11-14 and 18-25 are unobvious from and are patentable over Sandt in view of Finley under 35 U.S.C. 103.

The Examiner has rejected claims 26-31 under 35 U.S.C. 103(a) as being unpatentable over Sandt in view of Finley and further in view of Kennedy et al. The Examiner has relied on Kennedy as teaching the fencing system aspect of the present invention.

Applicant vigorously traverses this rejection.

Amended claim 26 defines a fencing system comprising hollow layered composites in the form of fence posts and fence rails with each of said fence posts and rails being produced by a single coextrusion process.

Applicant submits, in light of the argument presented hereinabove, that Kennedy does not supply the deficiencies apparent in the teachings of Sandt and/or Finely with regard to the present claims. As stated hereinabove, the primary and secondary references of Sandt and Finley do not teach or even suggest the coextruded composites of the present invention. Applicant submits that Kennedy, which teaches a conventional metal fencing system, does not disclose, teach or suggest the present invention, for example, the fencing system of the present invention defined in amended claim 26 including a plurality of posts and rails each having a outer layer, a core layer, and an inner layer defining a hollow space, and each of the posts and rails being produced by a single coextrusion process.

In view of the above, applicant submits that claims 26-31 are unobvious from and patentable over Sandt in view of Finley and further in view of Kennedy, under 35 U.S.C. 103(a).

Furthermore, each of the present dependent claims is separately patentable over the prior art. For example, none of the prior art, taken singly or in any combination, disclose, teach or even suggest the present apparatus or methods including the additional feature or features recited in any of the dependent claims. Therefore, applicant submits that all of the present claims are separately patentable over the prior art.

In conclusion, applicant submits that claims 1-16, 18-31, and 34 and 35 are allowable and respectfully requests the Examiner to pass the above-identified application to issuance at an early date. Should any matters remain unresolved, the Examiner is requested to call (collect) applicant's attorney at the telephone number given

below.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The paragraph on page 4, line 19, has been amended as follows:

Each one of the first, second and third polymeric materials of the composite layers preferably comprises a [thermal plastic] thermoplastic polymeric material. In one embodiment of the invention, at least two of the first, second and third polymeric materials have different chemical compositions.

The paragraph on page 4, line 24, has been amended as follows:

Preferably, the outer layer is made of a weatherable, [thermal plastic] thermoplastic polymeric material. The outer layer advantageously is substantially solid. As used herein, the term "weatherable" refers to the ability or property of a material to effectively withstand the conditions of an out-of-doors environment for a long period of time, for example, at least about five years and preferably at least about seven years or longer. Specific examples of polymers which can be used as the outer layer include, without limitation, polyvinylchloride, acrylonitrile/styrene/acrylic polymeric materials, and the like and mixtures or combinations thereof.

The paragraph on page 5, line 1, has been amended as follows:

Preferably, the second material comprises a solid [thermal plastic] thermoplastic polymeric material or a [thermal plastic] thermoplastic polymeric material foam or combinations thereof, and an effective amount of a filler. Suitable polymeric materials for the core layer include, without limitation, polyvinylchloride, acrylonitrile/styrene/acrylic polymeric materials,

acrylonitrile/butadiene/styrene polymeric materials, and the like and mixtures or combinations thereof. Any suitable filler component may be present in any of the layers of the present composites. Such filler component or components preferably are effective to add bulk and/or strength and/or reinforcement and/or stability to the layer and/or composite. Examples of useful filler components include, without limitation, wood, mica, talc, calcium carbonate, graphite or carbon, for example, in the form of particles, such as fibers, and the like and mixtures thereof. A filler component is particularly advantageous in the core layer, while the inner layer and/or outer layer preferably and substantially free of filler component. Preferably, the filler component of the core layer material comprises a wood component such as, but not limited to, wood particles, for example, wood shavings, wood chips, wood flour and the like and mixtures thereof. This use of a wood component advantageously provides an effective filler without unduly increasing the weight or cost of the composite.

The paragraph beginning on page 5, line 27, has been amended as follows:

The inner layer is circumscribed by the core layer and defines or bounds the hollow space of the composite. The inner layer can be made of a [thermal plastic] thermoplastic material which need not be weatherable, but preferably is effectively impact resistant. The inner layer is preferably substantially solid. Examples of materials that are suitable as the third polymeric material include, without limitation, polyvinylchloride, acrylonitrile/butadiene/ styrene polymeric materials and the like and mixtures or combinations thereof.

The paragraph beginning on page 8, line 31, has been amended

as follows:

Preferably, the outer layer 12 is comprised of a relatively thin layer of solid "weatherable" polymeric material. Suitable weatherable materials for the outer layer 12 include, without limitation, [thermal plastic] thermoplastic polymeric materials, such as polyvinylchloride, acrylonitrile/styrene/acrylic ("ASA") polymeric materials and the like, and mixtures, combinations or alloys thereof. The presently useful ASA polymeric materials can be made using any suitable methodology. See, for example, Hughes U.S. Patent 5,883,191; Yu et al U.S. Patent 3,944,631; Aliberto et al. U.S. Patent 4,517,339; Ting U.S. Patent 4,731,414; Ting U.S. Patent 4,831,079; and Moringa et al. U.S. Patent 4,151,226. The disclosure of each of these patents is hereby incorporated in its entirety herein by reference. Such ASA polymeric materials may be physical blends or mixtures of styrene/acrylonitrile copolymers and acrylic polymers and copolymers; acrylonitrile/ styrene/acrylic terpolymers, interpolymers including styrene-based units, acrylonitrile-based units and acrylic-based units, and the like and mixtures and combinations thereof.

The paragraph beginning on page 12, line 29, has been amended as follows:

The inner layer 16, which bounds the generally central, hollow space 20 of the composite member 10, can be made of any suitable [thermal plastic] thermoplastic material, preferably a solid [thermal plastic] thermoplastic material, which need not be weatherable, but preferably is effectively impact resistant for providing strength during fence assembly and/or use. Examples of polymeric materials that are useful for inclusion in the inner layer 16, include, without limitation, polyvinylchloride, acrylonitrile/ butadiene/styrene polymeric materials, and the like

and mixtures, alloys or combinations thereof.

The paragraph beginning on page 16, line 16, has been amended as follows:

The wood-filled [thermal plastic] thermoplastic material is provided in an extrudable form by subjecting a mixture of, for example, acrylonitrile/styrene/acrylic polymeric material and wood particles, to conditions effective to produce a substantially uniform, flowable or extrudable composition. Such conditions are described in detail in incorporated Hughes U.S. patent No. 6,133,349, and can generally include for example, elevated temperature conditions, elevated pressure conditions, shear or mixing conditions and combinations thereof. The substantially uniform composition is then introduced in a suitable coextrusion assembly along with the outer layer and inner layer materials, and formed by suitable connecting shapers or dies, into useful shapes and configurations as described hereinabove. It is preferable that, during the forming step, substantially no polymerization occurs. The composite can be subjected to any post-processing steps, such as texturing, painting and the like as may be desirable. Advantageously, the layered composites in accordance with the present invention do not require any mechanical means to secure the layers together. The co-extrusion process described hereinabove causes the layers to bond together without the aid of adhesives, glue, bonding agents or the like.

IN THE ABSTRACT OF THE INVENTION

Composite fence and decking components, for example, rails, posts and planks, are provided which generally include a weatherable outer layer, a core layer made of a [thermal plastic] thermoplastic polymeric composition and a wood component in an

amount effective as a filler, and an inner layer made of a [thermal plastic] thermoplastic material. The layers are configured so as to form a generally central hollow space. The components are light weight and inexpensive to manufacture. The components can be manufactured by using a single coextrusion process to produce a cylindrical form. The cylindrical form is passed through a reshaping die to form a composite having a desired cross sectional form, for example, a composite with a substantially square or rectangular cross section.

IN THE CLAIMS

1. (Amended) A composite having a length, the composite comprising:

an outer layer comprising a first polymeric material;
a core layer circumscribed by the outer layer and comprising a second polymeric material; and

an inner layer circumscribed by the core layer and comprising a third polymeric material, wherein the inner layer defines a hollow space[.] ;

the composite having a non-circular cross-section
perpendicular to the length and being produced by a single
coextrusion process.

3. (Amended) The composite of claim 1 wherein at least one of the first, second and third polymeric materials is a [thermal plastic] thermoplastic polymeric material.

4. (Amended) The composite of claim 1 wherein each of the first, second and third polymeric materials is a [thermal plastic] thermoplastic polymeric material.

10. (Amended) The composite of claim 1 wherein the core layer

includes an effective amount of a filler.

12. (Amended) The composite of claim 1 wherein the second polymeric material is a [thermal plastic] thermoplastic polymeric foam and [the core layer] includes a wood component in an amount effective as a filler.

13. (Amended) The composite of claim 1 wherein the second polymeric material is a solid [thermal plastic] thermoplastic polymeric material and [the core layer] includes a wood component in an amount effective as a filler.

14. (Amended) The composite of claim 1 wherein the core layer includes a wood component in an amount effective as a filler, and the second polymeric material is selected from the group consisting of polyvinylchloride, acrylonitrile/styrene/acrylic polymeric materials, [acrylonitrile/butadiene/styrene polymeric materials] and combinations thereof.

15. (Amended) The composite of claim 1 wherein the third polymeric material is [selected from the group consisting of polyvinylchloride, acrylonitrile/butadiene/styrene polymeric materials and combinations thereof] polyvinylchloride.

18. (Amended) A composite component having a length, the composite component comprising:

a weatherable outer layer comprising a first polymeric material;

a core layer circumscribed by the outer layer and comprising a wood-filled [thermal plastic] thermoplastic second polymeric material; and

an inner layer circumscribed by the core layer and comprising a [thermal plastic] thermoplastic third polymeric material, wherein

the inner layer defines a hollow space, the composite component being a fence component or a decking component[.];

the composite component having a non-circular cross section perpendicular to the length and being produced by a single coextrusion process.

26. (Amended) A fencing system comprising:

a plurality of fence posts; and

a plurality of fence rails fastened to the plurality of fence posts so as to form a fence, wherein each of said fence posts and fence rails comprises

a weatherable outer layer comprising a first polymeric material;

a core layer circumscribed by the outer layer and comprising a wood-filled [thermal plastic] thermoplastic second polymeric material; and

an inner layer circumscribed by the core layer and comprising a [thermal plastic] thermoplastic third polymeric material, wherein the inner layer defines a hollow space [.];

each of said fence posts and rails having a length and a non-circular cross section perpendicular to the length, and each of said fence posts and rails being produced by a single coextrusion process.

30. (Amended) The system of claim 26 wherein [each of the fence posts and fence rails has a length,] the core layer is circumscribed by the outer layer along substantially the entire length of [the member] each of said fence posts and rails, and the inner layer is circumscribed by the core layer along substantially the entire length of each of said fence posts and rails.